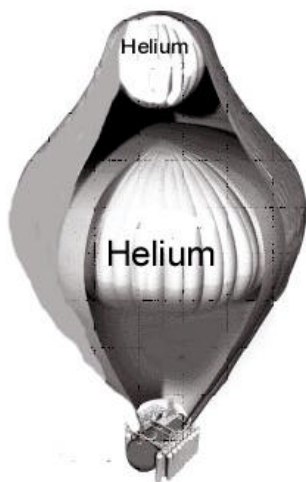


Name _____

Gas Pressure, Temperature, and Volume

Up, up and away... The properties of gases can take you far...

Flying in a Balloon



The first human flight occurred in the Eighteenth Century, but it took until 2002 for a human to fly around the world in a balloon. Today's modern balloon looks a lot like the one invented by Pilatre Rozier in 1864. Think about a balloon that begins at sea level and rises into the atmosphere. What kinds of changes would happen to the gas in the balloon as it rises? _____

Thinking about Matter

1. Today's balloons use helium but the first balloons used air. Here is a chart of the mass of air at various temperatures:

Temperature-Celsius Degrees	Mass of 1 m ³ of air at sea level
0	1.29 kilograms
5	1.27 kilograms
10	1.25 kilograms
15	1.23 kilograms
20	1.20 kilograms

What must happen to air to make a balloon rise? _____

2. You are traveling in Florida, and leave your bag (which contains your hair spray) in the hot car. When you unpack, you find sticky spray all over your clothes! Can you explain what happened?

3. A tire manufacturer was recently forced to recall tires because of several cases where they exploded under high speeds. The manufacturer could not recall all of the tires at one time, and so developed a plan where first the tires of cars in tropical countries would be recalled. Explain.

4. Watch the balloon demonstration. Predict what will happen to the volume of one of the balloons as it is cooled.

5. Explain your observations in terms that include particles (molecules) and energy. _____

Read the directions that “Grandma” left for canning tomatoes.

Grandma’s Directions for Canning Tomatoes

Get 15 quart jars, rings, and canning lids. Make sure the lids have clean, new rubber edges.

Peel 150 small tomatoes by dipping them quickly in hot water. The skins will slip right off.

Squash 10 warm tomatoes in each jar. Make sure they do not reach the top of the jar.

Lightly put the lids on each jar. Make sure that the edges of the lids and the jars are clean. (No tomato seeds.)

Lightly screw the rings on each jar. Do not put them on too tight!

Put the jars in a canner. Fill the canner with water so that it comes about half way up the jars.

Boil the water for 20 minutes.

Tighten the rings on each jar immediately. Let them cool.

When you hear a “pop” you know the can is ready to put away.

If you do not hear a “pop” do not use them—You will get poisoned!

6. Why does there have to be space at the top of the jar? _____
7. What happens to that space while the water is boiling? _____
8. Why do you not seal the rings before you heat the jar? _____
9. What happens after the lids are tightened? _____
10. What makes the lid “pop”? _____
11. Why is this a good way to preserve fruits and vegetables? _____